

rounded, occupying nearly the whole of the fore part of the sole. First hind toe reaching just to the base of the second; fifth to the end of the metacarpal of the fourth.

Molars much as in the subgenus *Isomys*, broad and rounded, with numerous small but well-marked cusps.

Approximate dimensions, in inches:—

Head and body.	Tail.	Hind foot.	Forearm and hand.	Ear- conch.	Skull.	Incisors to 1st upper molars.	Molar series.
6·2	5·8	1·01	1·18	0·65	—	·38	·21

Judging from the analogy of other species, I should imagine that *Mus nigricauda* is an arboreal animal; for in nearly all climbing Rodents we find the rather short feet, large rounded foot-pads, and more or less bushy tail characteristic of the present species. The Dormice, Squirrels, and, most closely analogous of all, the Climbing Vesper-mice of Tropical America (*Rhipidomys*), may be cited as examples of forms which possess the above mentioned accompaniments of an arboreal habit of life.

4. Description of the Pterylosis of *Mesites*, with Remarks on the Position of that Genus. By W. A. FORBES, B.A., Prosector to the Society.

[Received February 7, 1882.]

When making some observations on the pterylographical and other peculiarities of *Eupetes macrocercus*¹, I expressed regret at not having been able to obtain any specimen of *Mesites*, which in external appearance somewhat approaches *Eupetes macrocercus*, to study its pterylosis also.

Since then, having obtained through Herr G. Schneider, of Basel, a skin of *Mesites variegatus*, I have been able, from an examination of it, to complete our knowledge of this most peculiar form as regards the distribution of its feathers. All that was previously known of this part of the structure of *Mesites* was the existence in that bird of five pairs of powder-down patches², M. A. Milne-Edwards in his paper on it³ having confined his observations to its osseous and internal structure⁴. Those interested in the various opinions which have been held by naturalists as to the exact systematic position of *Mesites*, I will refer to M. Milne-Edwards's paper just quoted, only adding Mr. E. Bartlett's suggestion "that the

¹ P. Z. S. 1881, p. 838.

² Vide E. Bartlett, P. Z. S. 1877, p. 292.

³ Ann. Sci. Nat. (6) Zool. vii. 1878, art. 6.

⁴ An imperfect skull, extracted from the present skin, shows that the palate is schizognathous, the recurved maxillo-palatines being free in the middle line, and the vomer small and pointed—points not evident in Milne-Edwards's figure, his specimen, I believe, being somewhat imperfect.

genus *Mesites* should be arranged in the Natural System next to *Eurypyga* and its near ally *Rhinochetus*."

The nostrils of *Mesites* are long, linear concave-upward slits, extending for more than half the length of the beak, and covered above by a well-marked membranous valvular operculum, being in this respect very unlike the ordinary form of nostril in the Rails.

The tarsi have about 10 or 11 distinct transverse scutellæ anteriorly, best developed internally, and there nearly meeting, along the lateral surface, a similar but somewhat more numerous series of smaller scutellæ, which are developed along the posterior aspect of the leg, but become obsolete about $\frac{1}{2}$ inch above the metatarsophalangeal joint. Externally the two series of scutellæ are separated by a distinct space covered by smooth, non-scutellated skin. This tarsal scutellation extends upwards above the "knee" for about $\frac{1}{2}$ inch, for which extent therefore the tibia is bare of feathers.

The digits are all free from their bases; the hallux is considerably the smallest of them¹.

The number of remiges cannot be counted with certainty; but there are certainly 10 primaries; the wing is much rounded.

There are 16 rectrices, a very non-passerine character²; and both the upper and under tail-coverts are very long, with the last feathers rectriciform and extending along the tail for quite three fourths of its length both above and below.

There is apparently no claw on the pollex; and the contour-feathers have no aftershaft—in both these respects differing from the *Rallidæ*. The tail in my specimen has unfortunately been so cut that I have been unable to ascertain for certain whether the oil-gland is present or not. I can find no tuft, however; and as we know that the gland, though present, is nude both in *Rhinochetus* and *Eurypyga*, such is probably its condition in *Mesites* too³.

The continuous head-feathering extends about halfway down the neck, and then gives off the dorsal and ventral tracts of each side, which are separated by well-marked spaces, of which the dorsal one is considerably the biggest. The feathering of the lower part of the neck is thus quadriserial, separated by as many *apteria*. In the lower part of the neck the two dorsal tracts, which are narrow but strongly feathered, are widely separated, and somewhat divergent, including between them the anterior pair of dorsal powder-down patches, but converge again in the interscapular region. Here they suddenly become much feebler, and are then continued on as the much more weakly-feathered posterior part of the dorsal tract, this

¹ By soaking out the plantar tendons, I have been enabled to ascertain that there is a good *vinculum* between the *flexores longus hallucis* and *profundus digitorum*, the tendons of which are ossified near the bottom of the leg. In all ordinary Passeres, it will be remembered, this *vinculum* is quite absent.

² According to Nitzsch, however, this is the number met with in the male of *Menura superba*.

³ In answer to an inquiry on this subject, M. A. Milne-Edwards has been kind enough to inform me that his spirit-specimen of *Mesites* is also unfortunately damaged at the root of the tail, but that on an examination of a skin he finds apparently an oil-gland present with *no* tuft.

being of a furcate form, with the united part about 1 inch long, and inclosing a fairly broad median space. The limbs of this posterior fork are strongly dilated in the middle part of their extent, being there 6 to 7 feathers broad, and united externally by scattered feathers with the very broad and long lumbar tracts, which are arranged in about six rows of not closely-placed feathers, the posterior row of these being considerably the stronger.

The humeral tracts are not very broad or strong, and are quite distinct, anteriorly, from the inferior tract.

This last, which (as already described) commences on each side about halfway down the neck, springing at once independently from the continuous feathering of the anterior cervical region, ceases altogether at the commencement of the pectoral region (extending as far as the most anterior of the ventral powder-down patches to be presently described). It recommences, however, a little lower down as a very narrow tract, composed at first of only single feathers, but subsequently becoming stronger and broader (though even here only two feathers broad), in which condition it runs on, as the main inferior tract, to terminate near the vent.

Strange to say, what must be considered the equivalent of the outer pectoral branch of ordinary birds is here *quite free throughout* from the main stem, with which it is not even united anteriorly, where it is separated by the already-mentioned powder-down patch, whilst posteriorly it runs parallel to, but quite free from, the main stem.

The powder-down patches of *Mesites* resemble those of the *Ardeidæ*, of *Leptosoma*, and *Podargus* in their compactness, as well as in the definiteness of their areas, as opposed to the more scattered and diffused forms they present in *Rhinochetus*, *Eurypyga*, *Crypturus*, and other birds. But in their exact distribution they differ materially from any of these.

As already described by Mr. E. Bartlett, there are five pairs¹ of powder-patches in *Mesites*. Of these two pairs are dorsal, two ventral, and one lateral in position. All have the form of well-defined more or less oval areas, covered by a dense mat of closely aggregated long powder-down plumes.

The most anterior pair is placed close to the median line, the patches being only slightly separated from each other, at the commencement (apparently) of the interscapular region and inclosed between the two dorsal tracts, a little before these pass into their weaker posterior fork.

The *second* dorsal patch is situated on the rump, close to and just outside the terminal part of the dorsal tract, between that and the posterior termination of the lumbar tracts of each side.

¹ In the *Ardeidæ* the number varies from one pair (*Balaniceps*) to four pairs (*Cancroma*). Three is the most ordinary number. The presence of a single æcum in *Balaniceps* (as fortunately demonstrated by a preparation mounted in the Museum of the Royal College of Surgeons), together with these powder-down patches, renders its Ardeine nature nearly certain, as already suggested by Mr. A. D. Bartlett (P. Z. S. 1861, p. 131).

The *third* patch is inferior in position, lying just at the commencement of the pectoral region, between the two halves of the inferior tract internally and the anterior extremity of their separated pectoral branch externally.

The *fourth* patch is longer and narrower than its fellows, lying on the ventral region just outside the middle part of the inferior tract.

The *fifth* (lateral) patch lies more or less transversely, in the neighbourhood of the axilla, between the posterior ends of the outer pectoral and humeral tracts.

No Ardeine bird has any such lateral pair of patches; and only *Cancroma* has the anterior dorsal pair. These moreover lie *outside*, and not *inside*, the dorsal tracts in that bird. On the other hand, the concentrated patches of *Mesites* may easily be derived from the more diffused arrangement found in *Rhinochetus*¹ and *Eurypyga*.

A full account of the pterylosis of *Rhinochetus* is still a desideratum, Dr. Murie having unfortunately omitted any account of the systematically more-important contour-feather tracts in his account of the "dermal structures" of the Kagu (*l. c.*).

I have at present insufficient material to describe these thoroughly, though an examination of two imperfectly-feathered specimens in spirit demonstrates considerable agreement between the Kagu and *Mesites*. Of *Eurypyga* we likewise have but imperfect information, due to Nitzsch², and not to my mind very satisfactory, judging from the material before me.

In *Rhinochetus*, as in *Mesites*, the neck-feathering is quadriserial, though the median dorsal space is much narrower below and the lateral neck-spaces very broad; the two dorsal tracts terminate close together about the level of the anterior end of the scapulæ, and are quite separate from the posterior portion, which is only forked to a slight extent anteriorly, and widely dilated mesially. These differences seem to be due mainly to the greater development of the dorsal powder-down tracts of *Rhinochetus*, these covering most of the dorsal aspect of the trunk, except a narrow median space along the backbone and a reversed heart-shaped area on the pelvis, to which spaces therefore the contour-feathers are nearly confined.

Below, as in *Mesites*, the inferior tract of each side is nearly or quite broken up into two by the interruption of a patch of powder-down feathers; and the *pectoral* branch is likewise quite separated from the main tract, as in no other bird known to me except *Mesites*, powder-downs also intervening between the two. The humeral tract is quite free from the inferior one. On the other hand, in the number of its rectrices (16), and the absence of an aftershaft to the feathers, *Mesites* differs from *Eurypyga* and *Rhinochetus*, both of which have 12 rectrices³ and an aftershaft. The number of primaries in all is 10.

Mesites, *Rhinochetus*, and *Eurypyga* agree together, but differ from the *Rallidæ*, in having well-developed and strong rectrices, in

¹ Cf. Murie, Trans. Z. S. vii. pl. 56. figs. 1-3.

² 'Pterylography,' Ray Soc. ed. p. 129, pl. viii. fig. 15.

³ *Rhinochetus* has not 10, as erroneously stated by Murie, loc. cit. p. 468.

the possession of powder-down patches, in the oil-gland being nude (? *Mesites*), and in the interruption of the dorsal tract in the neighbourhood of the scapulæ. Pterylographically, therefore, there is no special reason to unite these forms with the Rails. Judging from M. Milne-Edwards's account and figures of the osteology of *Mesites*, numerous differences between these two forms also exist in the osseous parts of their structure. In particular, the fact of *Mesites* being schizorhinal is a strong point in view of its relationship being, along with *Rhinochetus* and its allies, to the Pluvialine group, where I have already¹ placed it. In spite of M. Milne-Edwards's remarks², I see no reason for doubting the value of the schizorhinal character of the nasal bones as a mark of the genetic affinities of birds, especially when, as in the present case, other facts point in the same direction.

I should be inclined therefore to consider (1) that *Mesites*, *Eurypyga*, and *Rhinochetus* have all sprung from some common ancestor, which must have been a generalized Pluvialine form provided with powder-down tracts; (2) that of the forms which this common stock gave rise to, all have become extinct save the three in question, which, having become isolated in three widely separated localities, have each acquired certain special characters not found in the others; (3) that, judging at least from the pterylosis, the Malagash *Mesites* is perhaps more nearly related to the New-Caledonian *Rhinochetus* than to the Neotropical *Eurypyga*.

5. Notes on the Anatomy of *Erethizon dorsatus*.

By ST.-GEORGE MIVART.

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Having had an opportunity, through the kindness of Dr. Günther, of examining a spirit-specimen of *Erethizon dorsatus*, the following points have appeared to me possibly of some interest.

The tongue is long and narrow, its extreme length being 4"·7 and its greatest breadth (at its hindmost end) being 1"·4; close to the tip it is only ·5 (cent.)³. Its hinder margin has a deep median notch. The intermolar eminence is considerable. There is no median groove on the dorsal surface; and there are but two oval and rather large circumvallate papillæ at the hinder margin of the tongue. The long axes of these two papillæ diverge forwards and outwards. The surface of the dorsum of the tongue is, for its anterior half, covered

¹ Ibis, 1881, p. 4, and P. Z. S. 1881, p. 644.

² The greater or lesser size of the beak will not account for the schizorhinal or holorhinal character of the nares, as suggested by M. Milne-Edwards. Else why should the big-billed *Platalæ*, Ibises, *Didymoculus*, *Laridæ*, *Alcidæ*, be all schizorhinal, whilst the slender-billed Rails, *Colymbidæ*, and such *Tubinares* as *Puffinus* and *Procellaria*, to say nothing of such forms as the *Meropidæ*, *Dendrocolaptidæ*, and *Nectariniidæ*, are all equally holorhinal? Nor can I admit with M. Milne-Edwards that the *Pteroclidæ* are related to the *Gallinæ*, or the *Ibididæ* to *Tantalus*, there being plenty of collateral evidence to prove the reverse. Hence any argument based on such assumed affinities also fails.

³ In this paper all the measurements are in centimetres, except where otherwise expressed.